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been noted. It would seem that, in this case at least, too much has been eliminated. The list is quite complete otherwise. It is particularly rich in references to the geology of the surrounding region. Such side references are especially valuable to workers in Missouri, since they recall widely scattered notes which might otherwise be overlooked. The paper also becomes more than a mere bibliography of Missouri. It is a guide to the study of the geology of the central Mississippi Valley and brings out excellently the development of our present knowledge from a historical point of view. Such a bibliography could only come as a result of wide studies throughout the region and is a natural sequence to the similar publication issued by Dr. Keyes while connected with the Iowa Survey.* The general scope and arrangement of the paper is the same as that followed by the author in the Iowa bibliography. The abstracts are perhaps briefer than those given by Mr. Weeks, but its value is very largely increased by the dictionary arrangement. A not unimportant feature of both the bibliographies reviewed is the very full accompanying index.

H. F. BAIN.

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON; THE 93D
REGULAR MEETING, WASHINGTON, D. C.,
FEBRUARY 11, 1897.

THE Society was called to order at 8 p. m. by the President, Dr. Bigelow, with twenty-five members and several invited guests present.

The first paper of the evening was read by Dr. E. W. Allen, and was entitled 'A Critical Review of Aikmann and Wright's Translation of Fleischmann's *Lehrbuch der Milchwirtschaft*,' an abstract of which has been presented by the author: "Attention was called to the heavy verbose style of the translation, and often foggy statements, errors in translating the sense and failure to adapt the book for English and American readers, and to correct certain statements which do not apply at the present status of knowledge. The fallacy of

*Iowa Geol. Surv., Vol. I., pp. 209-464. Des Moines, 1893.

translating a book for students and semi-popular use, without editing the translation and in a measure adapting it to the new field, was pointed out."

Dr. H. Carrington Bolton exhibited two British patents which he has described in *SCIENCE* (p. 401).

Mr. W. H. Krug read a review, from the German, of a paper by Adolph Meyer entitled 'The Maximum of Plant Production.'

Mr. Wirt Tassin's paper was entitled 'A New Blowpipe Reagent.' He gave a review of the use of iodine in blowpipe analysis from the time of Bunsen to Haanel and Andrews. He then stated that for several years past he had been using iodine in several forms and found that a mixture of equal parts of iodine and potassium sulfocyanate, plus a little sulfur, the whole being intimately mixed, fused and then ground, gave the most satisfactory results. The powder was used as a flux on a gypsum tablet. A series of the iodine and cyanate films produced by some forty minerals was shown. Some of these illustrated the extreme delicacy of the test; others showed the effect that the coating produced by one element had upon that produced by another when they were deposited together; still others showed the methods of differentiating interfering elements. Some attempts at quantitative methods were shown, and attention was called to the fact that a mixture of three parts of alcohol and one part of chloroform burned in a lamp gave rise to some very interesting reactions either with or without the iodine flux.

The Society adjourned at an early hour, and the remainder of the evening was devoted to feasting and social discourse.

SPECIAL MEETING, TUESDAY, MARCH 9, 1897.

A SPECIAL meeting of the Chemical Society was held in the Assembly Hall of the Builders' Exchange Club, under the auspices of the Joint Commission of the Scientific Societies of Washington, to hear the address of the retiring President, Dr. E. A. de Schweinitz, upon 'The War with the Microbes,' which will be printed in *SCIENCE*. The speaker was introduced by Surgeon General Sternberg, of the United States Army, and the hall was filled with members of

the Society, medical men and over 300 invited guests from the other scientific societies of Washington.

V. K. CHESNUT,
Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON; MEETING OF MARCH 10, 1897.

The Geological Relations of some Southern Iron Ores. By C. WILLARD HAYES, U. S. G. S.

Notwithstanding all that has been written concerning the Southern iron ores, there has as yet been no satisfactory statement of their geological relations. This is particularly true of the brown ores or limonites. The latter are separated by the writer into two classes, the gossan ores and the brown, valley ores. The latter class is by far the most important. An examination of many hundred deposits in connection with the study of the areal geology of the region in which they occur has led to a classification in three groups depending on their genesis and present relations. The first group comprises a large number of deposits composed chiefly of gravel ore imbedded in red clay near the top of the Knox dolomite. During the period of Tertiary baseleveling, the Chickamauga limestone, which overlies the Knox dolomite, was reduced to baselevel somewhat before the latter, and areas underlain by the limestone received the drainage from adjacent areas of the dolomite. Deposits of bog ore were there formed, and when the limestone was again reduced to a lower level, shortly after the elevation of the region, a part of the ore deposits were left at the altitude of the Tertiary peneplain, forming a fringe about the depressions which resulted from the removal of the limestone. Deposits belonging to the second group occur along the base of Cambrian quartzite ridges where the quartzite passes with steep dip beneath the siliceous limestone underlying the adjacent valleys. The deposits are regarded as segregations of the iron originally disseminated through the limestone, concentrated upon the impervious bed of quartzite during the progressive reduction of the limestone surface. In the third group are the extensive deposits associated with the numerous thrust faults of the region. While the deposits belonging to the two groups above described are due wholly to the surface

concentration of disseminated iron, the deposits of this group are produced, in part at least, by iron brought in solution from considerable depths below the surface. Their character depends largely on the kind of rocks cut by the fault. Where these are quartzites the iron may be in the form of ocher directly replacing the silica, or it may occur as the cement in a fault breccia or rarely, filling true fissure veins. The largest deposits occur in connection with faults between quartzite and limestone or between two limestone formations, where they are intimately associated with deposits of bauxite, the hydrated oxide of aluminium, and the two ores are probably closely connected in origin.

Geologic Notes on Kansas, Oklahoma and Indian Territory. By T. WAYLAND VAUGHAN, U. S. G. S.

Mr. Vaughan presented the results of a general reconnaissance made from Muskogee, I. T., via Tulsa, I. T., Perry, Enid and Alva, Oklahoma, to Coldwater and Medicine Lodge, Kansas; thence back to Coldwater, and south by Woodward, old Camp Supply, Taloga, Arapaho, to the Wichita mountains, in Oklahoma. The journey from Muskogee to Medicine Lodge was made in company with Professor L. F. Ward. The Wichita mountains were reconnoitered as far west the North Fork of Red River, east of Mangum, and along their northern side eastward to Ft. Sill, at their eastern end; thence eastward, keeping on the north side of the Arbuckle Hills.

Mr. Vaughan considered the Tishomingo granite (of Mr. Hill) in the Choctaw Nation, as probably of Archæan age. The axis of the Wichita mountains consists of solid plutonic masses, forming numerous isolated peaks, or groups of peaks, separated by wide, very level, grass-covered valleys. The mountains are very rugged and precipitous, and rise from several hundred to more than a thousand feet above the valleys between them. A series of the rocks collected was found to consist of hornblende granites, which form most of the mountains, and an interesting series of gabbro rocks. The rounded hills northwest of Ft. Sill are composed of quartz porphyry. The age of the plutonic axis of the Wichita mountains is still undeter-

mined, but as the Red Beds (Permotrias) were found resting against one of the granite masses, with an arkose at their base, it must be older than the Permian. The Silurian was found north of the Wichita mountains, forming hogbacks, and at Ft. Sill the fossils showed the limestone to be Ordovician. Ordovician and Upper Silurian strata were found north of the Arbuckle Hills.

No definite line could be drawn between the Carboniferous and the Permian, or between the Permian and the Trias.

In discussing the Cretaceous (Comanche Series) the following facts were noted: In the vicinity of Belvidere, Kansas, the Cretaceous extends above the highest divides, but is deposited upon the eroded surface of the Red Beds. As one goes southward the Cheyenne sandstone member disappears, the Kiowa shales become thinner, and the Cretaceous beds rest against the sides of the Red Bed hills. Ten miles northwest of Taloga, and in the vicinity of Arapaho, the Cretaceous is an agglomerate of *Gryphaea formiculata* (White), the *G. pitcheri* of Marcou, a few feet thick. The *Gryphaea tucumcarii* of Marcou, a fossil asserted by him to be Jurassic, often occurs imbedded in the same matrix.

The Great Plains formation does not extend as a continuous formation east of a line from Alva to Woodward, Taloga and Arapaho, nor south of Arapaho.

There were also communications on 'Oscillations of the Coast of California, during the Pliocene and Pleistocene,' by H. W. Fairbanks, and on a 'Discovery of Marine Cretaceous deposits in Eastern Virginia,' by N. H. Darton; but these are here referred to by title only, for want of space.

W. F. MORSELL.

U. S. GEOLOGICAL SURVEY.

ENTOMOLOGICAL SOCIETY OF WASHINGTON.

February 4, 1897. THE meeting was devoted to the annual address of the retiring President, C. L. Marlatt.

The address was entitled 'A Brief Survey of the Science of Entomology from its Beginning to the Present Time.' A running account was given of the history of the study of insects and

of the persons who have been most prominent in such work from the earliest times to the present, classified in accordance with their relation to prominent men or well marked periods. With the historical summary as a basis, estimates were made of various phases of the results of the study, as follows: An estimate was given of the total amount of the literature of entomology, considered both at the various past periods and at the present time. It was stated that the total writings on insects would probably amount to between 12,000 and 15,000 volumes of 500 pages each. The actual number of persons interested in the study of insects at various times was estimated, and from various sources of information it was deduced that there are from 3,000 to 4,000 persons now living who, either as students, writers or collectors, are interested in the science of entomology. The address concluded with a summary of the results so far accomplished, particularly in the field of systematic entomology and the relation this bears to what remains to be done. The estimates were based upon the actual number of described species, in comparison with the estimates of species still to be described or discovered, and also in connection with the present rate of progress as indicated by the annual or periodical works of record in zoology.

March 18, 1897. Mr. Ashmead showed specimens of *Halobatopsis beginii*, recently described by him in the *Canadian Entomologist*.

Dr. Motter read letters from Dr. Wyatt Johnson, of Quebec, and Garry de N. Hough, of New Bedford, giving accounts of investigations by both observers of the fauna of cadavers, and showing in what respects their results differed from his own.

Mr. Busck exhibited six larvæ of *Anthrenus varius*, each of which showed well marked wing pads on the second and third thoracic segments.

Mr. Ashmead read a paper entitled 'Five new hymenopterous parasites from *Canarsia hammondi*.' These parasites were among a series reared by Mr. W. G. Johnson in Illinois, in the course of an investigation of the host insect. The new species were *Spilocryptus canarsisæ*, *Limmeria canarsisæ*, *Apanteles canarsisæ*, *Elasmus meteori* and *Tetrastichus cœruleascens*.

Mr. Ashmead also read a paper entitled 'A

new species of *Roptronia*.' The type was collected by Mr. Garman in Kentucky.

Mr. Howard read a paper entitled 'On some parasites of Coccidæ,' in which he referred to the extraordinary geographical distribution of certain of the forms. *Aspidiotiphagus citrinus* (Craw), for example, has been found in many localities of the United States; at Grenada, B. W. I.; Portici, Italy; Punduloya and Kandy, Ceylon; Hong Kong and Amoy, China; Tamsui, Formosa; Yokohama, Japan; Newlands, Cape Colony; Brisbane, Queensland; Adelaide, South Australia; and Honolulu, Hawaii. He also showed that *Arrhenophagus chionaspidis* (Aurivillius) has an almost equally universal distribution, and announced the finding of the hitherto unknown male of this species in some material reared by Mr. Koebele at Macao.

A paper by Mr. W. J. Fox, entitled 'The species of the genus *Pepsis* found in America north of Mexico,' was read by title.

A synopsis of a paper entitled 'Notes on bred parasitic Hymenoptera, with descriptions of new species,' by Geo. Dimmock and Wm. H. Ashmead, was presented by Mr. Ashmead.

L. O. HOWARD,
Secretary.

NEW YORK ACADEMY OF SCIENCES, SECTION OF GEOLOGY, MARCH 15, 1897.

THE first communication of the evening was by Mr. Heinrich Ries, entitled 'Mineralogical Notes.' Mr. Ries spoke of some Allanite crystals with new faces; also of some large crystals of fibrous gypsum from Newcastle, Wyoming; also exhibited some large Childrenite crystals from Maine, and some Amphibole crystals with many terminal faces from Virginia. He also spoke of some Pseudomorphs of gold after Sylvanite from Cripple Creek, Colorado. The finding of a new Beryl crystal, with an unusually large number of terminal faces in New York City, was also noted.

The second paper of the evening was written by Mr. Herbert Bolton, entitled 'The Lancashire Coal Field of England,' and read in abstract by President Stevenson. The paper spoke of the geographic conditions of the Lancashire coal field and its neighborhood, of the extent and quality of the coal and of the age

of the structural movements which had caused the present geological characteristics in the coal area. A careful correlation was made between the Coal-measures of this field and the deposits of the United States. Distribution of the fauna and flora and their character was taken up in some detail, and it was shown that in the Lower Coal-measures the life is mostly marine, in the Middle Coal-measures of fresh and blackish origin, and in the Upper Coal-measures that the fauna was scarce. When published, this paper will be a valuable contribution to the literature of coals and will be of great assistance to workers in America in their endeavors to correlate the deposits on the two sides of the water.

The third paper of the evening was by Mr. Stuart Weller, of Chicago University, entitled 'The Batesville Sandstone of Arkansas,' and abstracted by Mr. Gilbert van Ingen. The paper entered into some detail regarding the Batesville section and the fauna of the Batesville sandstone in that section. Of the invertebrates thirty species have been found, of which eleven point to the St. Louis age of the sandstone, six to the Kaskaskia age, while thirteen are of indeterminate value. On account of the greater abundance of the numbers of specimens of the second group and from stratigraphic evidence as well, it is probable that the sandstone belongs in the base of the Kaskaskia group and is the same as the Aux Vasa limestone of southern Illinois. This paper gives the data wherewith to correlate the Mississippian section with the section about the Ozark Hills.

RICHARD E. DODGE,
Secretary.

NEW BOOKS.

Diseases of Plants induced by Cryptogamic Parasites. KARL FRELHERR VON TUBEUF. London, New York and Bombay, Longmans, Green & Co. 1897. Pp. xv+598.

The Fern Collector's Handbook and Herbarium. SADIE F. PRICE. New York, Henry Holt & Co. 1897. 72 figures.

Electricität direkt aus Kohle. ETIENNE DE FEDOR. Wien, Pest, Leipzig, A. Hartleben. Pp. vi+304. Mark 3.